The nature of the superincumbent beds being clay, points decidedly to precipitation in still waters, or those having little current, and such being the case, the keys, if lost overboard from a boat, would in the course of time sink by their own weight through the soft impalpable mud to the denser material of the old beach overlying the limestone.

Several instances were given of such settlement.

T. E. R.

Art. XI.—*The Week.*

By H. K. Rusden.

[Read 21st December, 1874.]

Circumstances have lately led me to investigate the subject of The Week, so far as the limited time and opportunities at my disposal permitted, and as a result I have a proposal to make, involving I conceive an improvement, equally important, desirable, and practicable. Before however explaining it in detail, it will be proper to glance at the natural history of the present conventional institution.

Materials for this investigation I have found to be meagre and scattered. I think, however, that there exist sufficient data to justify the decisive conclusion that the septenary cycle comes to us from the remotest antiquity; that is—from a period altogether prehistoric. The wide distribution of the week over Southern and Northern Asia, and also in Northern Europe, long before our era, is, I believe, unquestionable. This in itself would have little significance, were it not for a curious point of resemblance, which is unaccountable on any other theory than that of a common origin. It is very remarkable that the Scandinavians, the Chaldæans, the Persians, and the Hindoos, have always named the days from the planets, and in the same very peculiar order; peculiar in its curious variation from their relative astronomical order—real or supposed. The true order would be of course Sunday, Wednesday, Friday, Monday, Tuesday, Thursday, Saturday; after the Sun, Mercury, Venus, Moon, Mars, Jupiter, and Saturn. The Ptolemaic order would be Monday, Wednesday, Friday, Sunday, Tuesday, Thursday, Saturday. The deviation of all weeks from both these arrangements is identical and universal, and should therefore

be ascribed to a common source. Friday is the day held sacred by the Mahometans since the 6th century, and by the Hindoos for many thousands of years. Saturday is the Sabbath of the Jews, who were therefore supposed, according to Plutarch,* to be worshippers of Saturn. Sunday is held sacred to rest or recreation wherever the Christian religion prevails, and has been so since the 3rd century; and as most nations have worshipped the sun, it has probably been the most generally observed in ancient times.

Though the septenary cycle has been used by most branches of the Aryan family, it seems singularly to have been unknown to the Greeks, and to the Romans and ancient Etruscans; who used respectively cycles of eight and ten days; the two former until about the 2nd century after our era†. But though the dominion of the Romans in Britain lasted till the 5th century, it is evident that our ancestors did not acquire the week from them, but had obtained it previously from Scandinavia, as is partly proved by our present names of the days, which belong to the old Scandinavian mythology. Indeed it seems not quite clear whence the Romans acquired it. They did not get it with their amended calendar from Egypt in Cæsar's time, and it seems that they *could* have got it from the north as easily as from the east; for the Saxons and Kelts and other northern peoples had it long before their contact with the Romans.‡ Dio Cassius§ reports that the Romans derived it shortly before his time (born 155) from the Egyptians, who he says named the days from the seven planets—or bodies then known—of our solar system. But the Egyptians are positively asserted‖ to have more anciently used a cycle of ten—not seven—days; and if they thus only acquired the week so lately from the east, the probabilities of the Romans having obtained it from the north are increased. The Egyptians had not even any original astronomy of their own, as Sir G. C. Lewis shews in his *Astronomy of the Ancients,* chap. v., nor were the Chaldæans—from whom

* *Symposia* 5. Other points of resemblance between the Jewish and other mythologies are too striking for mere coincidence. Abraham corresponds with Brahma as well as with Saturn, Samson with Hercules Jephtha's daughter with Iphigenia, &c., &c.

† See Adams' *Roman Antiquities*, pp. 84 and 331.

‡ Rees' *Cyclopædia* (week) and *English Cyclopædia.*

§ *History of Rome*, vol. xxxvii. See Sir G. C. Lewis, *Astronomy of Ancients*, p. 304.

‖ Humboldt's *Cosmos*, vol. iv. p. 412, quoting Lepsius in a note.

they appear to have acquired what they possessed—the inventors or discoverers of it; nor were they the first to misapply it to purposes of astrology, or to name the days from the planets. Humboldt confidently says that shortly before our era, the Egyptians had not named the days from the planets, the signs of which were then perhaps only recently known to them. But Humboldt does not apparently consider, and perhaps could scarcely have been in possession of the ethnological and philological evidence, which modern research has revealed, of the great antiquity of a comparatively perfect civilisation and astronomy elsewhere, of which the relics only were found in India and Chaldæa. He, however, mentions that the Peruvians had a nine day cycle, with a day of rest in each; and that the Aztecs used weeks of five days, which they named from deities, one of whom, Wodan, was the counterpart of the Scandinavian Woden, from whom our Wednesday is named. The Indian Wednesday, Budhavaram, is thought to be derived from the same original as ours.

Mr. Proctor shows* that none of these peoples had any original astronomy, any more than the Egyptians; and I find elsewhere† that they reckoned eclipses, &c., by rules, of the origin and basis of which they had no knowledge. But Mr. Proctor shows also that all their old astronomical records present indications of having been derived from a far superior but extinct civilisation, of which no historical vestige remains, but which must have had its seat in a much more northern latitude. He says, that the length of the winter and summer days given in the oldest Brahminical and Persian records—the oldest Babylonian star risings obtained by Ptolemy—and the measurement of the earth adopted by ancient astronomers, all correspond to a latitude of about 45° north. Finally he adduces reasons—from old Chaldæan representations, which he reproduces, of Venus, Jupiter, and Saturn, as Mylitta, Bel, and Nisroch or Asshur; and from the fact of a plano-convex rock crystal lens having been discovered by Layard at Nimroud—for believing that these ancient astronomers probably possessed telescopic appliances of sufficient perfection to enable them to discern the crescent form of Venus, the satellites of Jupiter, and perhaps even the ring of Saturn.

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* *Saturn and his System*, (appendix on Chaldæan Astronomy).

† Bailly's *Histoire de l'Astronomie.*

From Sir Wm. Drummond's* work on the *Zodiacs* I am compelled to quote—though through an admittedly reliable channel—at second hand (which I regret, as I thereby lose the references to his authorities which he always gives).† He says: "The fact however is certain, that at some remote period there were mathematicians and astronomers who knew that the sun is in the centre of the planetary system, and that the earth—itself a planet—revolves round the central fire; who calculated, or like ourselves attempted to calculate, the return of comets, and who knew that these bodies move in elliptical orbits, immensely elongated, having the sun in one of their foci; who indicated the number of the solar years contained in the great cycle, by multiplying a period (variously called in the Zend, the Sanscrit, and the Chinese *ven, van,* and *phen*) of 180 years by another period of 144 years; who reckoned the sun's distance from the earth at 800,000,000 of Olympic stadia" (=91,931,818 miles at $606\frac{3}{4}$ feet to the stadium), "and who must therefore have taken the parallax of that luminary by a method, not only much more perfect than that said to be invented by Hipparchus, but little inferior in exactness to that now in use among the moderns" (much *more* exact, as it now appears, for Sir W. D. knew nothing of the late corrections of the estimated distance in question, which he only knew as $95\frac{1}{2}$ millions of miles); "who could scarcely have made a mere guess when they fixed the moon's distance from its primary planet at 59 semi-diameters of the earth; who had measured the circumference of our globe with so much exactness that their calculation only differed by a few feet from that made by our modern mathematicians; who held that the moon and other planets were worlds like our own, and that the moon was diversified by mountains, and valleys, and seas; who asserted that there was yet a planet which revolved round the sun beyond the orbit of Saturn, who reckoned the planets to be 16 in number, and who reckoned the length of the tropical year within three minutes of the true time; nor indeed were they wrong at all, if a tradition mentioned by Plutarch be correct."—*Drummond on the Zodiacs,* p. 36.

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* Sir Wm. Drummond died in 1828. He was a Fellow of the Royal Society, and British Ambassador at the Two Sicilies and at Constantinople. He wrote a *Review of the Government of Sparta and Athens*, *Herculanensia*, *Odin*, *Origines*, *Œdipus Judaicus*, and this work on the *Zodiacs*.

† See Godfrey Higgins' *Keltic Druids*, p. 50, and De Morgan's *Budget of Paradoxes*, p. 164.

With respect to the extent to which the Copernican or Pythagorean system was received about the time of our era, it will suffice to refer to St. Augustin (*De Civitate Dei*, lib. 16, ch. 9, vol. vii. Paris 1685) and Lactantius (*Institutiones Divinæ*, lib. 3, ch. 24, vol. i. Deux Ponts 1786), who both found the doctrine so prevalent as to require their special and too successful opposition and condemnation.*

I believe that M. Bailly,† the historian of astronomy, is the author of the specific hypothesis of an antediluvian highly civilised people, who, as he says, "brought the sciences to perfection; a people who in the great enterprise of discovering the exact measurement of the earth, dwelt under the 49th degree of latitude." He is often quoted without specific references, and his works in our Public Library are without that indispensable feature in the eyes of inquirers—a good index. The cycles were special subjects of investigation with Bailly. He held that the week was certainly antediluvian, concluding that it was impossible that the seven days composing it could have been dedicated to the same planets in Egypt, India, and Chaldæa, in identical order in these and in many other places beside, unless it had been derived from some older common source. As regards the prehistoric high civilisation his position seems impregnable. But his theory that it was destroyed or scattered by the traditionary flood seems irreconcileable with facts. In the first place the date assigned to Noah's flood, 1655 B.C., is not nearly so old as the Chinese and the Brahminical eras, which also imply a much older separate civilisation; and as Bailly remarks, they evidently exhibit the *débris* rather than the *elements* of science. But if the careful labours of Piazzi Smyth at the Great Pyramid have not been altogether thrown away and misrepresented too, the construction of that most ancient of monuments alone bears ample and irrefragable testimony to the existence—when it was designed—of astronomical and mathematical science,‡ far excelling any which obtained for thousands of subsequent

* See Patrice Larroque's *Examen Critique des Doctrines de la Religion Chretienne*, 4th ed. Paris, 1870. Vol. ii. p. 68. See also *Supernatural Religion*, p. 87, Australian Edition.

† Maire de Paris, Garde honoraire des tableaux du Roi. L'un des quarante de l'Academie Royal des Inscriptions et Belles Lettres, de celle des Sciences, et de l'Institut de Bologne, des Academies de Stockholm, de Harlem et de Padoue, et de la Société des Antiquités de Cassel.

‡ See Plates I., II., and III., pp. 27 and 28. I take Professor Smyth's best attested facts, but do not accept his theories.

years, but which must have been entirely obsolete and forgotten before the other pyramids in its vicinity were built; probably about 4,000 years ago. The Great Pyramid should thus be clearly antediluvian.

It seems also above all improbable that any flood should destroy so entirely all relics of a civilisation established—not on a low level—but on the elevated lands of high Asia. It seems to me that subsequent experience of the decadence of other civilisations gives a better key to the obliteration of that, which—I think with M. Bailly—certainly existed over fifty centuries ago to the north of Bokhara and Samarcand. We have every reason to believe that the esoteric system of the monopoly of knowledge by a small number of persons, prevailed in the greatest exaggeration in the most distant times. The vitality of the principle—which, though exploded in theory and in conscious practice, has still in a modified form its advocates—is a guarantee of its antiquity. I believe that that monopoly of knowledge and thence of wealth, necessarily produced an antagonism of classes, which, in the inevitable ultimate collision between them, resulted in the annihilation of the instructed few by the exasperated ignorant many; and that this same cause has always been the main factor in the evanescence and destruction of past civilisations. This is in any case a most important problem, which has met with wonderful neglect. But is it not absolutely accordant with the allegorical Oriental habit, and the esoteric system too, to understand this great deluge as an irresistible flood of barbarism and ignorance overwhelming all extant human wisdom? Have not such deluges been too frequent within historical time? Can the old legend be thus explained in a form in which—in strict accordance with the spirit of the record—the misrepresentation of natural catastrophes as possible manifestations of divine anger, is transformed into important historical admonition? I think so. I think—passing over many equally significant instances, such as the Egyptian, Persian, Tyrian, Greek, and Roman extinct glories, to one within our more immediate knowledge,—that the French revolution, which was essentially an outcome of a like antagonism of classes, similarly produced, and capable of entirely overwhelming a less distributed civilisation, was merely history repeating itself for perhaps the thousandth time; and that the only security *we* possess for the stability of *our* civilisation, lies in the wider and wider dissemination of knowledge, which prevents its

destruction in social cataclysms, and also tends to lessen the antagonism of classes.

From this primeval high civilisation, antecedent to that deluge, we derive I think, besides this significant lesson, the weekly cycle, the Great Pyramid, the Sanscrit language, the Zodiacal signs and constellations, if not the symbols of both—the still extant esoteric system of Freemasonry—Chaldæan and Indian astronomy—the Aryan race and civilising instinct—and in fact the germs of civilisation generally. It may be said that the invention of the week belongs to a very early period and rude condition in the history of Astronomy; being probably but a subdivision of the lunar cycle. Doubtless so it is. But that marks some progress made, especially as I think the week was a subdivision of the sidereal revolution of the moon in 27·32166 days, not of the synodical one of 29·53059 days; which is the more obviously observable cycle, though not approximately divisible by four; and which forms the apparent basis of the Julian and other months of 30 and 31 days. The Kelts, I find, had not only the seven-day week but twelve months also;* and I have met with a statement† with regard to astronomy, to the effect that Rudbeck calculated from the displacement of a festival recorded as being anciently fixed at 20 days from the winter solstice, that the Swedes 2,300 years B.C. knew the right number of days in the year, though they had not provided the intercalation necessary to compensate for the fractional excess. Nevertheless, the coincident order of the Scandinavian days, and the Aryan roots in the Keltic languages, prove their indebtedness to the same stock as the Indian and Chaldæan civilisations. For further instance, it can scarcely be a mere coincidence that the British measure of capacity—the *quarter*—that of which it is a quarter having otherwise completely eluded research, corresponds closely with the cubic measure of which the standard is extant in the antechamber of the Great Pyramid, and which is an *exact* QUARTER of the contents of the great coffer or sarcophagus in the King's Chamber.‡ Professor Piazzi Smyth considers that he has identified many other interesting items of our inheritance in the Great Pyramid.

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* See Toland's *History of the Druids.*

† Bailly's *Histoire de l'Astronomie Ancienne*, p. 324.

‡ See Plate II. p. 27.

I have alluded to the curious order in which the days of the week succeed each other, which is found consistently the same wherever the weekly cycle is known, and which does not correspond at all to the real or supposed astronomical order of the planets after which the days are named. Dio Cassius says that the order of the days had relation, 1st, to the musical intervals; or 2nd, to the astrological allotment of the planets to the hours of the day; or 3rd, to their distribution among the signs of the Zodiac. It is a curious fact, that the astrological appropriation of the hours of the day, as well as of the days themselves, to the seven bodies of our then known solar system—as being peculiarly under their influence—should furnish the method of connection between the universal order of the days, and the order of the planets in the Ptolemaic solar system. For the astrological order was of ancient date in Ptolemy's time, and his solar system was therefore scarcely his, but was based upon that of the Astrologers. In the absence of any other known or probable basis for the connection of the order of the week days with that of the planets, I conceive that it had its origin in the pernicious esoteric system, by which everything was rendered enigmatical and obscure to all but the initiated.

I am not aware of any particular probable site of the high civilisation thus inferred by Bailly, Drummond, and Proctor, as the common source of its various posthumous offshoots in different directions. According to Mr. Proctor, it should be five degrees farther north than Samarcand (39°56), and it seems to me that the most moderate guess at its date must be at least 6,000 years ago, and that it is probably much further back. Bunsen* reckons the immigration of the Aryans into India at from 80 to 100 centuries B.C., and Laplace mentions two epochs, 2,000 and 15,000 years ago, at which the significance of the signs of the Zodiac in the position of the heavens was so marked as to suggest their introduction then. He says†—referring to the greater period —"Capricorn, or the constellation of the Goat, appears to be more properly placed at the highest than at the lowest point of the sun's course." I know not whether he included in his scheme the fact of Canopus (in Arabic the *south* star) having actually been about that time a south pole star,‡ or

* Brande's *Dictionary* (Aryan).
† Laplace's *Système du Monde*, p. 316.
‡ Dupuis' *Origines des tous les Cultes*, vol. iii. p. 426.

that the Samaritan Pentateuch commences with the words, "In the beginning the GOAT (Azima) created the heaven and the earth,"* which is neither absurd nor unintelligible if read—"When the Zodiacal signs were first distributed, Capricornus held the dominant position indicated by Laplace." These are merely coincidences with Dupuis' great work, which I remarked on reading Laplace's statement. Laplace had doubtless far more substantial reasons for his opinion. It is, perhaps, right to mention that Laplace respectfully differs from Bailly as to the antiquity of astronomy; but with all deference to his weighty authority, I cannot but think that the philological evidence discovered since his time, more than outweighs his objections.

The suicidal esoteric system seems to have subsisted in this primeval civilisation in the most exclusive form, and to have effectually prevented the spread and survival of more than mere fragments of the knowledge upon which it was based. But I believe that ethnology and philology both point to the same approximate site for the original home of the Aryan family and speech. The patriarchs of the Brahmin race seem to have been those who survived the collapse of their ancestors' civilisation, and are admitted to have brought with them to India (but how long afterwards must be mere matter of conjecture), amongst the relics of their former state, the Sanscrit language, the weekly cycle, and a half-understood or forgotten astronomy; together with the most radical distinctions of classes known.

I think it reasonable to suppose, that if the Brahmins exhibit signs of the most direct derivation from the primeval civilised race, they were probably the immediate survivors of the social convulsion, which is supposed to have almost annihilated the antecedent civilisation. The customs (and among them notably the week) which appear to be due to the same source, and which still survive among the descendants of the Kelts and Scandinavians, I should judge to have spread westward long before the extinction of the civilisation which gave them birth. Those which survive in China were probably received thence at even an earlier date. The Chinese appear to me to exhibit the *rudiments* rather than the *débris* of an astronomical science, and never to have advanced beyond them, though they have always made and recorded observations. The authors of the Chinese calendar

* *Ib.* vol. v. p. 67.

may have emigrated from, or only had communication with, the Aryan patriarchs, after the division of the year into months of the length of the sidereal lunar revolution, the division of which by four gives the ordinary weekly cycle. For although it is generally stated, mainly I believe on the authority of Freret* in the last century, that the Chinese have a cycle of ten days instead of seven, and though Laplace ascribes to them a cycle of 60 days, as well as 60 years, still on referring to Sir John Davis' work (an unimpeachable authority I believe) on the Chinese, I find (vol. ii. p. 73) that he, after admitting points of resemblance between the astronomical systems of India and China, indirectly shows that the Chinese have at least an equivalent of a septenary cycle. He says "the Chinese reckon *five* planets, to the exclusion of the sun and moon, but they give the names of one of their twenty-eight lunar mansions" (into which their Zodiac is divided) "successively to each day of the year in a perpetual rotation, without regard to the moon's changes; so that the same four out of the twenty-eight invariably fall on our Sundays, and constitute as it were, perpetual Sunday letters. A native Chinese first remarked this odd fact to the author, and on examination it proved perfectly correct." This coincidence appears to me to arise from the simple fact that their cycle is a multiple, and therefore a full equivalent of ours; and as they make no intercalations of less than a full month of 28 days, the coincidence is perpetual. Though the Chinese thus have not a perfect septenary cycle, still their system without doubt, regarding other coincidences, originated—though at a very distant date—from the same source as ours, with which it synchronises so well. Laplace says the seven day week was known to them from the most remote periods. Their monthly cycle, and their sixty year cycle, are probably as old as their era, or 45 centuries, if not as old as Fo Hi, or 52 centuries past.† There is certainly no geographical or chronological improbability in the derivation of the Chinese calendar from the locality indicated, and I think that the division of the 28 days cycle—based doubtless on the sidereal lunar period in preference to the synodical period—is strongly suggestive of a common origin with the seven day week, after the more accurate determination of the moon's revolution.

* See *Encyclopædia Britannica*, art. Chronology.

† See Meadows' *The Chinese and their Rebellions*, p. 329.

Not only, however, is the great antiquity of the weekly cycle sufficiently and conclusively established, but its wide expansion over the world, even to islands of the southern oceans, argues a far more ancient origin than that to which it has been commonly referred. If, as modern criticism claims to have shown, the Hebrew Scriptures were not compiled before the time of Ezra, or Hilkiah, or Samuel at farthest* (that is the 5th, the 7th, or the 11th century B.C.), the Sabbath (and the Jews had no specific names for the other days of the week†), which is not mentioned from the 40th to the 15th century B.C., was actually not instituted—even for the Jews—according to their own records, until at least 15 centuries (and probably many more) after the septenary cycle was in use by the Chaldeans, the Hindoos, and probably the Scandinavians and Chinese. But even supposing for the nonce that Moses himself really had instituted the Jewish Sabbath, *his* reputed date is only the 16th century B.C., while Fo Hi's in China was the 33rd; the Kali Yug in India was the 31st; the Scandinavian was the 23rd; and Egyptian records, according to Bunsen, extend back to the 35th, when the astronomy from which their eras were all derived was forgotten and lost. It has always been a standing difficulty—why, if the Sabbath was, as such, instituted at the supposed creation—or 40 centuries B.C., its observance should never have been inculcated even on the Jews for more than 20 centuries after. The accommodative principle upon which the recorded six days of creation have been expanded into as many geological periods, only magnifies this difficulty indefinitely.

This rough sketch of the materials for forming an opinion respecting the age and origin of the week, is far from exhaustive, or even satisfactory in itself; being based necessarily upon anything but original authorities. But it is, I think, amply sufficient for my purpose, which is simply to show that though doubtless Sunday was always as sacred for us in Europe as Friday is for a Hindoo or a Mahometan, or Saturday for a Jew; yet there is evidently nothing intrinsic in the day itself, or in the septenary cycle, or in the origin of either, to determine their perpetuation otherwise than as they concur with human convenience. But if there were other grounds for preserving either intact, still after

* See Horne's *Introduction*, and Sir Isaac Newton's *Observations on Daniel.*

† Humboldt's *Cosmos*, vol. iv. p. 413. *English Cyclopædia* and Horne's *Introduction.*

the numerous changes and alterations of calendars by every people, the identification of any particular day must now be purely arbitrary, and the real original seventh day it must now be a matter of impossibility to distinguish.* No objection therefore on that ground can be valid against a further alteration of the day or week, provided that preponderating reasons can be adduced on other grounds in favour of it. In fact, the only way possible now, to make sure of sometimes hitting on the right original seventh day, if any, is to alter the cycle to another number of days, which would of course make the new Sunday, or Sabbath, or day of rest, occasionally coincide with the original one.

I now come to the proposition—the making of which is the object of this paper. This is, to shorten the week from seven to five days, as the Romans formerly found it convenient to reduce theirs from eight to seven. I am satisfied from a variety of reasons that the present week is too long. I think that people work much harder now than they did when the septenary cycle was first instituted, and that six days of such continuous hard work to one of rest is too much. This is proved by the innovations made upon the Saturday, which is now neither one thing nor the other. It is admitted that it is no business day; that for business purposes it is practically worthless. People attend at their offices as a mere matter of form, though as a business day they allow that it is a delusion and a mockery. But as a holiday it is worse than a delusion; it is a snare. It is no holiday. For no one worth noticing gets it all, and very many—particularly those who most require it—never get it at all. It is clear that the eight hours movement is of very partial benefit, and the fact that numerous classes are entirely and hopelessly excluded from it, makes it extremely desirable to devise some method of affording them equivalent advantages. I cannot see that this can be done, unless by a change like that which I propose. In any case, the only thing that the half-Saturday does plainly and completely, is this; it

* I find that it is a disputed point when the Hebrew calendar was formed. It has been referred by some to our year 500, by others to 325, by others 300, while some contend for an older origin. (*English Cyclopædia*, art. Calendar.) I am willing to concede a possibly much greater antiquity for it than is even claimed, and I offer the following as a rational solution—in strict accordance with the known style of esoteric Oriental tradition—of a part of Genesis (ch. 5), which has hitherto defied reconciliation with experience or probability. I think it not unlikely that the exceptional longevity attributed to the antediluvian patriarchs, and which Professor

furnishes ample proof that the week is felt by every one to be too long.

Now the lunar synodic cycle is twenty-nine days and a little over a half. A weekly cycle therefore of six days, or five days, would synchronise with the lunar cycle much more nearly than any division of twenty-eight could possibly do; if it were any object to conform to a lunar period at all. I recommend the quinary rather than the sexenary cycle. It would concur better with the denary scale now in use in notation and computation; it would leave no odd day over in an ordinary year; and I believe it would better proportion hard labour to rest. If any man works his best for four full days continuously, I think that he will be quite ready, and that it will be good for him, to rest on the fifth. This is all that would really be necessary, except the rigorous preservation of the fifth day as a day of rest from labour; and of intellectual cultivation, for which one day in five would be little enough, though infinitely better than any evening after a hard day's work.

But the proposed change would not be nearly such a startling innovation as it might at first sight appear. By having a complete universal holiday, on one day in five, instead of one day and a half (but the half-day neither universal nor complete) in seven, there would be really a difference of but one seventieth. That is, there would be in seventy days—at four working days and one rest day to the week—fourteen complete days of rest; and at five and a half working days and one and a half rest days to the week, fifteen days of rest. My plan would thus subtract just one-seventieth of rest from those who get more than they require, but would secure to those who really want it the real equivalent of the half day which *now* they cannot get.

But the advantages of making the months of a uniform length of thirty days or six weeks each, leaving an odd week, and in leap year also an odd day, for an annual festival to welcome the new year, are so very clear and great, as to

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Owen has concluded to have been physiologically impossible, may really be a symbolical record of the numerous attempts to discover the true length of the annual cycle; and that Enoch the *perfect* man who was *taken* and accepted by God, and who lived just *three hundred and sixty-five* years, represents the epoch when that was discovered to be the true number of days in the year, and the calendar was thenceforward upon that basis taken and accepted as perfect. I am of course aware that the record refers to no specific date, and that it was promulgated and perhaps written after the 10th Century, B.C.

induce me to include this amendment also in my proposal. I think it would be a great convenience and advantage to be able to know at once the day of the week by that of the month; or the day of the month by that of the week. Commercially and privately, the vast simplification of all calculations of interest, wages, &c., by making all the months of a uniform length, would prove of immense advantage. Indeed, at present, in the calculation of interest, the great inconveniences of reckoning by the week or month, are so obvious, as to lead to their abandonment altogether; and interest tables are always constructed for the number of days alone, which has then to be adapted in each case to the actual period required. The constantly recurring complex computations rendered inevitable by the weeks and months being non-coterminous, and the months being of various lengths, involve an enormous amount of unnecessary labour, which my proposal would entirely obviate.

I will offer one or two simple illustrations of the advantages of the change. Say—on what day of the week will fall the 3rd of next September or October, or the 23rd of those months? It would take some time under present arrangements to ascertain this simple information, without an almanac; and even with one the easiest plan would be to refer to it for each required day separately. By my plan you would know at once, without reference or calculation, that the 3rd, 8th, 13th, 18th, 23rd, and 28th of every month must always fall on the 3rd day of the week, and the like would be as easily known of every other day of the week or month. Say—next, to what does five shillings a week for nine months amount? or for one month? You cannot give it at all, until the month or months are specified, and then the amount will vary for other nine months, or another month. Whereas by my system of having six weeks in each month, you would know at once that five shillings a week is thirty shillings a month, and adding one week to the twelve months it is £18 5s. a year. The enormous saving in trouble, time, and labour, which would thus constantly accrue, must be obvious. Nearly all the ordinary every day calculations of wages, &c., would be saved entirely, and after the first year almanacs would be almost superfluous.

I think it would furnish also a very good opportunity for discarding the present old pagan names of our days, by substituting others for them, such as "Oneday," "Twoday," "Threeday," "Fourday," for the current heathen names of

the week days, and some appropriate distinctive name instead of Sunday, which has of course been a complete misnomer ever since the worship of the sun on that day was abolished. "*Restday*" would too readily suggest idleness as the proper use of it, and ignore the fact that the best mental rest is variation rather than cessation of occupation. I think that "*Goodday*" would best express the intended value and right use of it. I also think that the odd intercalatory day every fourth year should be a "*goodday*" added at the end of the year.

Such an alteration would interfere with the calendar no further than as it would prove a convenience. All dates, historical, legal, or commercial; all anniversaries and calendrical epochs, are fixed by the day of the year or month, not of the week, and therefore would not be affected. In fixing the date of Easter-day, it would give two-sevenths more precision. It would, in fact, greatly facilitate every computation in which portions of a year, month, or week, were factors. Indeed it is difficult to see whom or what it would affect otherwise than advantageously. The proportion of weekly to daily wages would adjust itself at once. To those engaged in ordinary necessary labour on Sundays now, it could, of course, make no difference; while to those engaged in the special ministrations and exercises which are regarded as peculiarly appropriate to the Sunday, it would afford additional opportunities, in the twenty-one more Sundays, or total of seventy-three in the year, of performing duties for which time is all too short, and must appear to those who sincerely delight in them still shorter. From this class, therefore, I count upon the strongest support.

I contemplate one possible effect with much complacence. If our Jewish brethren would also adopt my suggestion, on account of what I cannot but regard as its manifest advantages, how gratifying it would be to know that they were enjoying their holiday at the same time as ourselves. I protest that I never meet a Jew going to or returning from his synagogue on Saturday, without feeling a strong impulse to apologise for doing my secular business upon his Sabbath, while he is debarred from doing his upon our Sunday. The present one-sided distinction always strikes me painfully as a relic of ancient illiberality and alienation of feeling, which should surely now be obsolete, and I cannot but think that the adoption of a common day of rest would tend much to promote the social feeling to which it is so desirable that

there should be no exception. The fact that these excellent fellow-citizens have hitherto had practically only five working days a week to our six, is demonstrative proof that six working days in seven are not indispensable. Four working days in five are obviously a larger proportion by 3-35ths, than five in seven. But should the sect to which I allude decline to adopt the quinary week which I propose, were *we* to do so, there would still occur on every seventh Goodday and fifth Sabbath, a synchronism of practice which would surely promote a sympathy of feeling. The prospect of the attainment of such objects is surely a strong ground of recommendation of my scheme.

I propose thus simply to have a week of five days, instead of seven. This would give exactly 73 complete weeks in a common year, and one day over in leap year. I also recommend the allotment of an equal number (30) of days, or six weeks, to each month, leaving over one festival week, say at the new year, with an extra "Goodday" added every leap year. I presume that an act of the Legislature would be necessary to give effect to the proposal, but public opinion must, of course, precede legislative action. I have thought it better to make the suggestion first to this Society, in order that it may be at once subjected to the skilled criticism of those competent to say whether any inconvenience could possibly result in connection with the calendar, so that objections on that score, which is really of primary importance, might be disposed at once one way or the other. When no rational objection can be discovered to a proposal of this kind, it is not unusual to allege that, however desirable it may be in theory, it would nevertheless be bad in practice, or that it would be *impracticable*.* Such an argument of course yields entirely the question of expediency, but is itself obviously no better than the opposite simple assertion; and if reasons be on the other hand advanced to show that similar innovations have formerly been successfully made, it stands refuted until at least the experiment be tried. But in this case far more difficult innovations, even involving an alteration of the calendar, have at different times been made with perfect success by Julius Cæsar, Pope Gregory XIII, and others. But more, the week itself was actually altered by the Romans, Greeks, and many other peoples; and, in

* For the refutation of this "Fallacy of Confusion," see Bentham's *Book of Fallacies*, ch. 9.

fact, as there is no record of any attempt to alter the week having ever failed, the allegation of impracticability is so far proved to be utterly baseless. The probability is that there would be no difficulty whatever.

I think the perfect practicability, as well as the many and manifest advantages of this scheme, would be apparent on the printing of the first almanac in conformity with it. But the greatest of its benefits could not possibly be appreciated until after it should have been carried into practical execution. I mean the great relief to those who really labour hardest and who cannot now secure opportunities for self-improvement.

Doubtless some people can congratulate themselves upon having rest and leisure enough. Some, there is shrewd reason to suspect, have too much of both. My proposal accommodates even them, by reducing their superfluous leisure by one-seventieth. But it is not made expressly in their interest. I make it in the interest of those who, by the force of circumstances, have too little; who not only labour hard on five days and a half in every week, but cannot secure time for self-improvement on the other half of the Saturday which their more fortunate neighbours have and do not appreciate, and which they are never likely also to get, unless it be guaranteed to them by making it as inviolable as Sunday itself.

I append a table showing the names of the days of the week in ten different languages, and three diagrams from Piazzi Smyth's *Our Inheritance in the Great Pyramid*, giving sufficient proofs of the science displayed in the construction of that ancient monument.

NAMES OF THE DAYS OF THE WEEK IN

English.	*French.*	*Latin.*	*Italian.*	*Spanish.*	*Portuguese.*
Sunday	Dimanche	Dies Solis	Domenica	Domingo	Domingo
Monday	Lundi	Dies Lunæ	Lunedì	Léones	Secunda feira
Tuesday	Mardi	Dies Martis	Martedi	Martes	Terza feira
Wednesday	Mercredi	Dies Mercurii	Mercoledi	Miercoles	Quarta feira
Thursday	Jeudi	Dies Jovis	Giovedi	Jueves	Quinta feira
Friday	Vendredi	Dies Veneris	Venerdi	Viernes	Sexta feira
Saturday	Samedi	Dies Saturni	Sabbato	Sabado	Sabbado

German.	*Dutch.*	*Arabic.*	*Brahman.*
Sonntag	Zondag	Youm el ahad	Addita varam
Montag	Maandag	Youm eth thani	Soma varam
Dienstag	Dingsdag	Youm eth thaleth	Mangala varam
Mittwoch	Woensdag	Youm el arbaa	Bouta varam
Donnerstag	Donderdag	Youm el khamis	Brahaspati varam
Freitag	Vrijdag	Youm el djoumaa	Soucra varam
Samstag	Zaturdag	Youm el effabt	Sany varam

Based upon Arago's *Pop. Astronomy*, vol. ii. p. 727.

Art. XII.—*Notes on some of the Physical Appearances Observed in the late Transit of Venus.*

By R. L. J. Ellery, F.R.S., F.R.A.S.

[Read 21st December, 1875.]

In these brief notes relating to the physical appearances observed during the transit of Venus, of December 9th, I do not intend to refer, except in a cursory manner, to any of the more mathematical data of the occurrence, for these are not yet fully reduced, and will be only valuable when combined with similar results obtained at other parts of the earth's surface.

The weather in Melbourne, and indeed nearly throughout all Victoria, was very unpromising in the morning of the occurrence; but fortunately the clouds broke away in Melbourne at the very nick of time, so that the first internal contact and some of the preceding phases were well seen. The previous rain and subsequent occasional showers had the effect of rendering the atmosphere exceeding favourable for observation, and, so far as the earlier phases of the transit were concerned, the atmospheric conditions were unusually good; for any one accustomed to observing the sun will know that it is only on such favourable occasions when the sky is seldom clear of clouds that its edge can be observed sharp and clear without what is termed "boiling," so that what was otherwise an unpromising state of the weather, was actually most favourable for observation of the physical appearances of the transit. I